Sameera Pisupati

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Objective

Motivated and research-driven Ph.D. student seeking the opportunity to contribute to cutting-edge research in AI, cybersecurity, and privacy-preserving technologies under your guidance. Passionate about advancing next-generation solutions through rigorous experimentation, analytical problem-solving, and cross-disciplinary collaboration. Skilled in effectively communicating complex technical concepts, working with diverse research teams, and contributing to high-impact publications. Eager to align my academic goals with your lab's vision and contribute meaningfully to impactful research outcomes.

Experience

- **University of North Texas** *Jan 2025 - May 2025*
  Lab Safety Tutor Denton, TX
  - Enforced laboratory safety protocols, including proper use of PPE, handling hazardous materials, and maintaining safe work environments.
  - Supervised student lab activities, ensuring compliance with lab procedures and safe equipment operation.
  - Assisted students and faculty with technical tasks, including operation of machinery such as waterjets, wire EDMs, and 3D printers.
  - Supported lab preparation, experiment setup, and demonstrations in coordination with faculty.
  - Maintained lab organization by inspecting equipment, reporting damage, and ensuring cleanliness.

- **John Deere** *Feb 2019 - Dec 2024*
  Research Engineer Moline, IL
  - Led the architecture design of an enterprise-grade AI platform using Docker and Kubernetes to enable containerized deployment, secure service isolation, and scalable orchestration across hybrid cloud environments.
  - Designed and implemented streaming security analytics pipelines using Apache Kafka, Flink, and Elasticsearch to enable real-time anomaly detection and response.
  - Integrated privacy-preserving computation frameworks (Homomorphic Encryption, SMPC) to protect sensitive operational data in distributed AI systems.
  - Automated ML lifecycle and security compliance workflows using MLflow, Argo Workflows, and HashiCorp Vault, improving model traceability and governance.
  - Collaborated with cross-functional research teams to translate theoretical models into production-ready systems, bridging academic innovation with applied engineering.
  - Conducted adversarial risk assessments and integrated zero-trust security principles to harden system defenses against real-world attack vectors.
  - Developed high-performance model serving infrastructure using TensorFlow Serving and gRPC APIs, reducing model inference latency by 35 %.
  - Built automated data ingestion and processing pipelines with Airflow, Spark, and Delta Lake to support large-scale experimentation and research reproducibility.
  - Led proof-of-concept implementations for novel AI-driven security techniques, contributing to technical whitepapers and joint research outputs.
  - Delivered executive-level research presentations, documenting experimental results, architectural design decisions, and performance metrics to drive strategic initiatives.

- **CVS Health** *May 2017 - Jan 2019*
  Data Engineer Woonsocket, RI
  - Designed and maintained end-to-end ETL/ELT pipelines using Apache Airflow, Apache NiFi, and AWS Glue, enabling reliable data flow across heterogeneous sources.
  - Engineered high-throughput data ingestion frameworks leveraging Kafka and Spark Streaming, ensuring low-latency processing for downstream analytics.
  - Developed and optimized SQL and NoSQL databases (MySQL, PostgreSQL, MongoDB, Cassandra), improving query performance and storage efficiency.
  - Built enterprise-grade data warehousing solutions with Snowflake, BigQuery, and Amazon Redshift to support advanced analytics and reporting workloads.

- Implemented data partitioning, indexing, and schema design strategies to scale infrastructure for millions of daily transactions.
- Integrated data quality and observability systems with Great Expectations, dbt, and custom validation checks to proactively detect anomalies and schema drift.
- Automated infrastructure provisioning and CI/CD using Terraform, Jenkins, and containerization with Docker and Kubernetes.
- Enforced data security and governance using Apache Ranger, AWS IAM, and role-based access control, ensuring regulatory compliance and protection of sensitive assets.
- Partnered with data scientists, analysts, and product teams to deliver well-structured, high-quality datasets for machine learning and business intelligence use cases.
- Monitored and optimized data workflows with Grafana and Prometheus, improving pipeline reliability and reducing processing delays by over 30 %.

EDUCATION

- **University of North Texas** *Jan 2025 - Present*
  Ph.D in Computer Science and Engineering Denton, TX
  - **Research Focus**: AI, Security and Privacy, Cybersecurity.
- **University of North Texas** *Jan 2016 - May 2017*
  MS in Engineering Technology Denton, TX
  - GPA: 3.5/4
  - **Research Focus**: Advanced Manufacturing and Industry, Big Data, Sustainable and Renewable Energy.
- **Jawaharlal Nehru Technological University** *July 2011 – May 2015*
  BS in Electronics and Communications India
  - GPA: 3.6/4
  - **Research Focus**: Advanced Signal Processing and Machine Learning, IoT (Internet of Things) and Edge Computing, Wireless Communication.

PROJECTS

- **Privacy-Driven Federated Sensor Intelligence Platform** *Jan 2023 – Dec 2024*
  Tools: Python, PyTorch, OpenSSL, Docker, Kubernetes, TLS, Zero-Trust Frameworks
  - Designed a scalable federated intelligence platform to securely process and aggregate sensor data across distributed industrial nodes.
  - Integrated federated learning to enable collaborative model training without exposing sensitive operational data.
  - Applied identity management, encryption at rest and in transit, and zero-trust segmentation to reduce attack surface.
  - Implemented real-time monitoring and policy-based access controls to ensure system integrity in a multi-site industrial environment.
- **Intelligent Pest Detection and Threat Mapping** *Nov 2020 – Jan 2023*
  Tools: PyTorch, OpenCV, YOLOv8, QGIS, REST APIs, Docker
  - Developed an autonomous UAV-based pest detection system using deep learning for early crop protection.
  - Implemented secure communication layers between UAVs, edge processors, and visualization dashboards.
  - Integrated geospatial threat mapping with encrypted storage and controlled data access.
  - Enhanced detection accuracy and reliability with real-time analytics and secured data flow.
- **AI-Enhanced Precision Irrigation Forecasting** *Feb 2019 – Oct 2020*
  Tools: Python, TensorFlow, Airflow, Grafana, AWS, MQTT, TLS
  - Built a predictive irrigation system integrating IoT sensors and satellite imagery for water demand forecasting.
  - Applied LSTM and geospatial analytics for real-time irrigation decision support.
  - Secured sensor telemetry with end-to-end encryption and authenticated communication channels.
  - Reduced exposure to external threats by enforcing network access control and anomaly detection.
- **Predictive Modeling for Neurodegenerative and Oncological Disorders** *May 2017 – Jan 2019*
  Tools: Python, Scikit-Learn, TensorFlow, Pandas, NumPy, R
  - Developed predictive models for early risk assessment of neurological and oncological conditions.
  - Integrated biomarker-based features and clinical variables to classify risk groups.
  - Incorporated privacy-preserving preprocessing and pseudonymization to protect sensitive data.
  - Applied secure data management and model interpretability techniques to support ethical AI research.

PUBLICATIONS

C=CONFERENCE, J=JOURNAL

[J.1] Pisupati S, Kundukoori D, Mekala N, Kaluvan S, Zhang H, "Design of resonance based DC current sensor using BAW quartz resonators, " Sensors and Actuators A: Physical, Vol. 271, pp. 104-110, 2018.

[C.1] Puppala S, Hossain I, Alam MJ, Talukder S, Ferdaus J, Hasan M, Pisupati S, Mathukumilli S, "Generative AI like ChatGPT in Blockchain Federated Learning: use cases, opportunities and future", in arXiv preprint arXiv:2407.18358, 2024.

[C.2] Ferdaus J, Pisupati S, Hasan M, Paladugu S, "FedRobo: Federated Learning Driven Autonomous Inter Robots Communication For Optimal Chemical Sprays", 2024.

SKILLS

- **Programming Languages:** Python, JavaScript, TypeScript, Java, R, SQL, Bash
- **Web Technologies:** React.js, Node.js, Express.js, HTML5, CSS3, RESTful APIs, GraphQL
- **Database Systems:** MySQL, PostgreSQL, MongoDB, Cassandra, Redis
- **Data Science & Machine Learning:** TensorFlow, PyTorch, Scikit-Learn, XGBoost, Pandas, NumPy, Matplotlib, Seaborn, SciPy, Statsmodels
- **Cloud Platforms:** AWS (S3, EC2, Lambda, Glue), Google Cloud (BigQuery, Vertex AI), Microsoft Azure
- **DevOps & CI/CD:** Docker, Kubernetes, Git, GitHub Actions, Jenkins, Terraform, PyTest, unittest, Jest, Mocha
- **Security & Privacy:** Homomorphic Encryption, Secure Multi-Party Computation (SMPC), Zero-Trust Architecture, HashiCorp Vault, Apache Ranger, IAM/RBAC, Privacy-Preserving ML, Federated Learning
- **Data Engineering & Monitoring:** Apache Airflow, Kafka, NiFi, MLflow, Argo Workflows, Elasticsearch, Grafana, Prometheus, Tableau, Power BI
- **Mathematical & Simulation Tools:** MATLAB, LTspice, RStudio, Excel (Advanced Analytics)

AWARDS

* Patent Pending for Diagnostics Trouble Codes Grouping cluster prediction at John Deere.
* Nominated for outstanding employee awards in 2022.
* Placed first in global IT Hackathon Conference at John Deere

LEADERSHIP EXPERIENCE

- **Team Lead** *June 2021 - Dec 2024*

  John Deere

  * Led a cross-disciplinary team of graduate students to design and implement a secure AI-based system, ensuring successful project milestones and research deliverables.
  * Coordinated weekly research sprints, assigned tasks, and facilitated technical discussions to align project goals with publication targets.
  * Presented findings at lab meetings and research symposiums, improving visibility of the project within the department.